

AMENDMENTS TO THE CLAIMS:

Please amend the claims as follows:

1-19. (Cancelled).

20. (New) A fuel cell power generation system comprising:
a reformer producing a hydrogen-rich fuel gas by reacting a raw material with water vapor;
a fuel cell generating power by using the fuel gas and an oxidizing gas;
a raw material flow rate detecting instrument which detects the flow rate of the raw material supplied into said reformer;
a water vapor flow rate detecting instrument which detects the flow rate of the water vapor supplied into the reformer;
a fuel gas flow rate detecting instrument which detects the flow rate of the fuel gas produced in said reformer; and
a deterioration degree detecting instrument which calculates the degree of deterioration of said reformer by comparing the calculated flow rate of the fuel gas calculated from the flow rate of the raw material and the flow rate of the water vapor with the detected flow rate of the fuel gas detected.

21. (New) The fuel cell power generation system according to Claim 20, wherein said deterioration degree detecting instrument calculates the flow rate of the fuel gas produced when said reformer is not deteriorated as the calculated flow rate.

22. (New) A fuel cell power generation system comprising:
a reformer producing a hydrogen-rich fuel gas by reacting a raw material with water vapor;
a fuel cell generating power by using the fuel gas and an oxidizing gas;
a raw material flow rate detecting instrument which detects the flow rate of the raw material supplied into said reformer;
a water vapor flow rate detecting instrument which detects the flow rate of the water vapor supplied into said reformer;

a differential pressure detecting instrument which detects the difference of pressure of the fuel gas between two predetermined points on the flow path of the fuel gas; and

a deterioration degree detecting instrument which calculates the degree of deterioration of said reformer by comparing the calculated value of the difference of pressure of the fuel gas between the two predetermined points calculated from the flow rate of the raw material and the flow rate of the water vapor with the detected value of the difference of pressure of fuel gas between the two predetermined points.

23. (New) A fuel cell power generation system according to Claim 22, wherein said deterioration degree detecting instrument calculates the difference of pressure of the fuel gas produced when said reformer is not deteriorated between the two predetermined points as the calculated value.

24. (New) A fuel cell power generation system comprising:

a reformer producing a hydrogen-rich fuel gas by reacting a raw material with water vapor;

a fuel cell generating power by using the fuel gas and an oxidizing agent gas;

a raw material flow rate detecting instrument which detects the flow rate of the raw material supplied into said reformer;

a water vapor flow rate detecting instrument which detects the flow rate of the water vapor supplied into said reformer;

a concentration detecting instrument which detects the concentration of water vapor or the concentration of raw material in the fuel gas; and

a deterioration degree detecting instrument which calculates the degree of deterioration of said reformer by comparing the calculated value of the concentration of water vapor contained in the fuel gas calculated from the flow rate of the raw material and the flow rate of the water vapor with the concentration of water vapor or the concentration of raw material detected.

25. (New) A fuel cell power generation system according to Claim 24, wherein said deterioration degree detecting instrument calculates the concentration of water vapor or the concentration of raw material contained in the fuel gas produced when said reformer is not deteriorated as the calculated value.

26. (New) The fuel cell power generation system according to Claim 20, further comprising a reformer heating instrument which raises the reaction temperature of said reformer

according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is possible.

27. (New) The fuel cell power generation system according to Claim 22, further comprising a reformer heating instrument which raises the reaction temperature of said reformer according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is possible.

28. (New) The fuel cell power generation system according to Claim 24, further comprising a reformer heating instrument which raises the reaction temperature of said reformer according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is possible.

29. (New) The fuel cell power generation system according to Claim 20, further comprising a water vapor flow rate controlling instrument which controls the flow rate of the water vapor according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the water vapor increases to cause the flow rate of the fuel gas to be not less than a value at which power generation of said fuel cell is possible.

30. (New) The fuel cell power generation system according to Claim 22, further comprising a water vapor flow rate controlling instrument which controls the flow rate of the water vapor according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the water vapor increases to cause the flow rate of the fuel gas to be not less than a value at which power generation of said fuel cell is possible.

31. (New) The fuel cell power generation system according to Claim 24, further comprising a water vapor flow rate controlling instrument which controls the flow rate of the water vapor according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the water vapor increases to cause the flow rate of the fuel gas to be not less than a value at which power generation of said fuel cell is possible.

32. (New) The fuel cell power generation system according to Claim 29, further comprising a raw material flow rate controlling instrument which controls the flow rate of the raw material to increase according to the degree of deterioration detected by said deterioration

degree detecting instrument so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is possible.

33. (New) The fuel cell power generation system according to Claim 30, further comprising a raw material flow rate controlling instrument which controls the flow rate of the raw material to increase according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is possible.

34. (New) The fuel cell power generation system according to Claim 31, further comprising a raw material flow rate controlling instrument which controls the flow rate of the raw material to increase according to the degree of deterioration detected by said deterioration degree detecting instrument so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is possible.

35. (New) The fuel cell power generation system according to Claim 20, further comprising a generated power output control instrument which controls the generated power output according to the degree of deterioration detected by said deterioration degree detecting instrument so that the generated power output decreases to not greater than a value at which power generation of said fuel cell is possible.

36. (New) The fuel cell power generation system according to Claim 22, further comprising a generated power output control instrument which controls the generated power output according to the degree of deterioration detected by said deterioration degree detecting instrument so that the generated power output decreases to not greater than a value at which power generation of said fuel cell is possible.

37. (New) The fuel cell power generation system according to Claim 24, further comprising a generated power output control instrument which controls the generated power output according to the degree of deterioration detected by said deterioration degree detecting instrument so that the generated power output decreases to not greater than a value at which power generation of said fuel cell is possible.

38. (New) A fuel cell power generation system according to Claim 24, wherein said water vapor concentration detecting instrument detects the water vapor concentration by detecting the dew point of the fuel gas flowing through the flow path of the fuel gas.

39. (New) A fuel cell power generation system according to Claim 24, wherein said water vapor concentration detecting instrument detects the water vapor concentration by detecting the relative humidity of the fuel gas flowing through the flow path of the fuel gas.

40. (New) A fuel cell power generation system according to Claim 24, wherein a water flow rate meter of measuring the amount of water which is supplied to produce the water vapor to be supplied into said reformer is provided instead of said water vapor flow rate detecting instrument, and said deterioration degree detecting instrument calculates the degree of deterioration of said reformer on the basis of the supplied amount of water measured by said water flow rate meter instead of the flow rate of the water vapor.

41. (New) The fuel cell power generation system according to Claim 20, comprising a life diagnosing instrument which determines the falling rate of the degree of deterioration based on the degree of deterioration of said reformer and the power generation time to calculate the period to reach the lower limit of the degree of deterioration of said reformer at which power generation of said fuel cell is made possible.

42. (New) The fuel cell power generation system according to Claim 22, comprising a life diagnosing instrument which determines the falling rate of the degree of deterioration based on the degree of deterioration of said reformer and the power generation time to calculate the period to reach the lower limit of the degree of deterioration of said reformer at which power generation of said fuel cell is made possible.

43. (New) The fuel cell power generation system according to Claim 24, comprising a life diagnosing instrument which determines the falling rate of the degree of deterioration based on the degree of deterioration of said reformer and the power generation time to calculate the period to reach the lower limit of the degree of deterioration of said reformer at which power generation of said fuel cell is made possible.

44. (New) The fuel cell power generation system according to Claim 20, wherein said deterioration degree detecting instrument uses conversion ratio of methane as the degree of deterioration of said reformer.

45. (New) The fuel cell power generation system according to Claim 22, wherein said deterioration degree detecting instrument uses conversion ratio of methane as the degree of deterioration of said reformer.

46. (New) The fuel cell power generation system according to Claim 24, wherein said deterioration degree detecting instrument uses conversion ratio of methane as the degree of deterioration of said reformer.

47. (New) A method of detecting the degree of deterioration of a reformer of a fuel cell power generation system comprising:

a raw material flow rate detecting step of detecting the flow rate of a raw material supplied into said reformer which produces a hydrogen-rich fuel gas by reacting a raw material with water vapor;

a water vapor flow rate detecting step of detecting the flow rate of the water vapor supplied into said reformer;

a fuel gas flow rate detecting step of detecting the flow rate of the fuel gas produced in said reformer; and

a deterioration degree detecting step of calculating the degree of deterioration of said reformer by comparing the calculated flow rate of the fuel gas calculated from the flow rate of the raw material and the flow rate of the water vapor with the detected flow rate of the fuel gas detected.

48. (New) A method of detecting the degree of deterioration of a reformer of a fuel cell power generation system comprising:

a raw material flow rate detecting step of detecting the flow rate of a raw material supplied into said reformer which produces a hydrogen-rich fuel gas by reacting a raw material with water vapor;

a water vapor flow rate detecting step of detecting the flow rate of the water vapor supplied into said reformer;

a fuel gas flow rate detecting step of detecting the flow rate of the fuel gas produced in said reformer;

a differential pressure detecting step of detecting the difference of pressure of the fuel gas between two predetermined points on the flow path of the fuel gas; and

a deterioration degree detecting step of calculating the degree of deterioration of said reformer by comparing the calculated value of the difference in pressure of the fuel gas between the two predetermined points calculated from the flow rate of the raw material and the flow rate

of the water vapor with the detected value of the difference in pressure of fuel gas between the two predetermined points.

49. (New) A method of detecting the degree of deterioration of a reformer of a fuel cell power generation system comprising:

a raw material flow rate detecting step of detecting the flow rate of the raw material supplied into said reformer which produces a hydrogen-rich fuel gas by reacting a raw material with water vapor;

a water vapor flow rate detecting step of detecting the flow rate of the water vapor supplied into the reformer;

a concentration detecting step of detecting the concentration of water vapor or the concentration of raw material in said fuel gas; and

a deterioration degree detecting step of calculating the degree of deterioration of the reformer by comparing the calculated value of the concentration of water vapor contained in the fuel gas calculated from the flow rate of the raw material and the flow rate of the water vapor with the detected water vapor concentration or the concentration of raw material concentration.

50. (New) A fuel cell power generation method which executes power generation of a fuel cell using a fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 47, comprising:

a reformer heating step of raising the reaction temperature of said reformer according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the fuel gas is not less than a value at which power generation of the fuel cell is made possible.

51. (New) A fuel cell power generation method which executes power generation of a fuel cell using a fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 48, comprising:

a reformer heating step of raising the reaction temperature of said reformer according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the fuel gas is not less than a value at which power generation of the fuel cell is made possible.

52. (New) A fuel cell power generation method which executes power generation of a fuel cell using a fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 49, comprising:

a reformer heating step of raising the reaction temperature of said reformer according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the fuel gas is not less than a value at which power generation of the fuel cell is made possible.

53. (New) A fuel cell power generation method which executes power generation of a fuel cell using a fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 47, comprising:

a water vapor flow rate controlling step of controlling the flow rate of the water vapor according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the water vapor increases to cause the flow rate of the fuel gas to be not less than a value at which power generation of said fuel cell is made possible.

54. (New) A fuel cell power generation method which executes power generation of a fuel cell using a fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 48, comprising:

a water vapor flow rate controlling step of controlling the flow rate of the water vapor according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the water vapor increases to cause the flow rate of the fuel gas to be not less than a value at which power generation of said fuel cell is made possible.

55. (New) A fuel cell power generation method which executes power generation of a fuel cell using a fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 49, comprising:

a water vapor flow rate controlling step of controlling the flow rate of the water vapor according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the water vapor increases to cause the flow rate of the fuel gas to be not less than a value at which power generation of said fuel cell is made possible.

56. (New) A fuel cell power generation method which executes power generation of a fuel cell using fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 47, comprising:

a raw material flow rate controlling step of controlling the flow rate of the raw material to increase according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is made possible.

57. (New) A fuel cell power generation method which executes power generation of a fuel cell using fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 48, comprising:

a raw material flow rate controlling step of controlling the flow rate of the raw material to increase according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is made possible.

58. (New) A fuel cell power generation method which executes power generation of a fuel cell using fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 49, comprising:

a raw material flow rate controlling step of controlling the flow rate of the raw material to increase according to the degree of deterioration detected by said deterioration degree detecting step so that the flow rate of the fuel gas is not less than a value at which power generation of said fuel cell is made possible.

59. (New) A fuel cell power generation method of executing power generation of a fuel cell using the fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 47, comprising:

a generated electric power output controlling step of controlling the generated power output according to the degree of deterioration detected by said deterioration degree detecting step so that the generated power output decreases to not greater than a value that allows power generation of said fuel cell.

60. (New) A fuel cell power generation method of executing power generation of a fuel cell using the fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 48, comprising:

a generated electric power output controlling step of controlling the generated power output according to the degree of deterioration detected by said deterioration degree detecting

step so that the generated power output decreases to not greater than a value that allows power generation of said fuel cell.

61. (New) A fuel cell power generation method of executing power generation of a fuel cell using the fuel gas by making use of the method of detecting the degree of deterioration of the reformer of the fuel cell power generation system according to Claim 49, comprising:

a generated electric power output controlling step of controlling the generated power output according to the degree of deterioration detected by said deterioration degree detecting step so that the generated power output decreases to not greater than a value that allows power generation of said fuel cell.

62. (New) A recording medium, which can be processed by a computer, having a program allowing a computer to perform as said deterioration degree detecting unit of the fuel cell power generation system according to Claim 20 for calculating the degree of deterioration of said reformer by comparing the calculated flow rate of the fuel gas, calculated from the flow rate of the raw material and the flow rate of the water vapor, with the detected flow rate of the fuel gas.

63. (New) A recording medium, which can be processed by a computer, having a program allowing a computer to perform as a deterioration degree detecting instrument of a fuel cell power generation system according to Claim 22 for calculating the degree of deterioration of said reformer by comparing the calculated value of the difference in pressure of fuel gas between the two predetermined points calculated from the flow rate of the raw material and the flow rate of the water vapor with the detected value of the difference in pressure of the fuel gas between the two predetermined points.

64. (New) A recording medium, which can be processed by a computer, having a program allowing a computer to perform as a deterioration degree detecting instrument of a fuel cell power generation system according to Claim 24 for calculating the degree of deterioration of said reformer by comparing the calculated value of the concentration of water vapor or the concentration of the raw material contained in the fuel gas, calculated from the flow rate of the raw material and the flow rate of the water vapor, with the concentration of the detected water vapor.